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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,683	08/01/2003	Jeffrey Ming-Jer Yang	P1535	2701

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EXAMINER

PHU, SANH D

ART UNIT	PAPER NUMBER
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2618

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,683

Applicant(s)

YANG ET AL.

Examiner

Sanh D. Phu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 8-16 is/are allowed.
6) ☒ Claim(s) 1-5 and 17-20 is/are rejected.
7) ☒ Claim(s) 6 and 7 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1/29/04 & 10/13/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The IDS filed on 1/29/04 has been considered, except for the non-patent literature document (KI YOUNG KIM ET AL., Cellular/PCS Dual-band MMIC Power Amplifier of a Newly Devised single-Input single-Chain Network; IEEE GaAs Digest; 04/03, pp 129-130; USA) is not considered and initialed by the examiner because the applicant fail to provide a legible copy of this document.

Claim Rejections – 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakahara et al (EP 0 634 836 A2).

-Regarding to claim 1, see figure 5, and page 5, line 53 to page 6, line 36, Nakahara et al discloses a bi-directional amplifier (see figure 5) having a first mode and a second mode comprising:

- a first port (20a);

- a second port (20b);

- a first amplification path (500b, 100B, 500a) electrically connected between the second port and the first port, biased to directionally couple a signal from the second port to the first port during the first mode and biased off during the second mode (see page 5, line 53 to page 6, line 5, page 6, lines 24-29); and

- a second amplification path (500a, 100A, 500b) electrically connected between the first port and the second port, biased to directionally couple a signal from the first port to the second port during the second mode and biased off during the first mode (see page 6, lines 11-23) .

-Regarding to claim 2, Nakahara et al discloses that said first amplification path is a common source amplifier (comprising (7a, 7b), which have sources commonly grounded).

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-Regarding to claim 3, Nakahara et al discloses that said second amplification path is a common source amplifier (comprising (7a, 7b), which has sources commonly grounded).

-Regarding to claim 17, as similarly applied to claims 1-5, Nakahara et al discloses a method (see figure 5) for bi-directionally amplifying an electrical signal, said method comprising:

step (see figure 5) of providing a bi-directional amplifier having a first mode, (which can be called as a receive mode), and a second mode, (which can be called as a transmit mode), and including a first port (20a) , a second port (20b), a first amplification path (500b, 100B, 500a), and a second amplification path (500a, 100A, 500b);

step (comprising (18) and ((13) of (100B))) of biasing the first amplification path electrically connected between the second port and the first port to directionally couple a signal from the second port to the first port during the first mode and biased off during the second mode (see page 6, lines 10-29); and

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step (comprising (18), ((13) of (100A))) of biasing the second amplification path electrically connected between the first port and the second port, biased to directionally couple a signal from the first port to the second port during the second mode and biased off during the first mode (see page 6, lines 10–29).

–Regarding to claim 18, Nakahara et al discloses that said first amplification path is a first amplifier (comprising (7a, 7b)) including source terminals, and further including the step of grounding said source terminals (see figure 5).

–Regarding to claim 19, Nakahara et al discloses that the second amplification path is a second amplifier (comprising (7a, 7b)) including source terminals, and further including the step of grounding said source terminals (see figure 5).

Claim Rejections – 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara et al in view of Hibbs, Jr et al (4,054,837).

—Regarding to claim 5, in Nakahara et al, said second mode is a transmit mode for transmitting an output signal to the second port and said second amplification path is a transmitter amplifier (comprising (7a, 7b)) for amplifying an input signal received at the first port and providing the output signal to the second port (see figure 5). Nakahara et al further discloses a transmitter electrode (13) which is biased at a high voltage potential “bias voltage” (see page 6, lines 18–23) when the transmitter amplifier is in the transmit mode.

Nakahara et al does not disclose whether the transmitter amplifier is optimized for high power.

Hibbs, Jr et al teaches that transmitter amplifier can be implement with power amplifiers, e.g., class B or Class C, for high power amplification (see col. 2, lines 38–42).

Therefore, for an application for high power amplification, it would have been obvious for a person skilled in the art to implement Nakahara et al transmitter amplifier (comprising (7a, 7b)) with power amplifiers, as taught by Hibbs, Jr et al, so that the amplification of the transmitter amplifier would be optimized for high power in order to meet the requirement of high power amplification.

–Regarding to claim 20, Nakahara et al does not teach step of providing a radiating element that is electrically connected to said second port.

Hibbs, Jr et al teaches that a bidirectional amplifier can be employed for a case of a radio transceiver remotely located from its antenna, or namely its radiating element, in such a way that the bidirectional amplifier is located close to and electrically connected to the antenna to amplify a received signal being received by the antenna before it is attenuated in the long line between the transceiver and antenna, and also to amplify a transmitted signal at the antenna to reduce the power loss in the long line (see col. 1, lines 20–30).

Therefore, for an application for an use of Nakahara et al bidirectional amplifier, it would have been obvious for a person skill in the art to employ

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Nakahara et al bidirectional amplifier for a case of a radio transceiver remotely located from its antenna, or namely its radiator, as taught by Hibbs, Jr et al, in such a way that the bidirectional amplifier is located close to and electrically connected to the antenna at said first port or second port, to amplify a received signal being received by the antenna so that the attenuation in the long line between the transceiver and antenna would be compensated, and to amplify a transmitted signal at the antenna so that to reduce the power loss in the long line would be reduced.

With such the application, it can be said that Nakahara et al in view of Hibbs, Jr et al teaches step of providing a radiating element that is electrically connected to said second port, as claimed.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakahara et al in view of Lazzarotto et al (6,937,615).

–Regarding to claim 4, in Nakahara et al, said first mode is a receive mode for receiving an input signal from the second port and said first amplification path is a receiver amplifier (comprising (7a, 7b)) for amplifying the received input (see figure 5). Nakahara et al further discloses a receiver

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electrode (13) which is biased at a high voltage potential "bias voltage" (see page 6, lines 18–20) when the receiver amplifier is in the receive mode (see page 6, lines 24–29).

Nakahara et al does not disclose whether the receiver amplifier is optimized for low noise.

Lazzarotto et al teaches that a receiver amplifiers can be implemented with low-noise amplifiers, e.g., GaAs FETs, in order to be optimized for low noise by minimizing the noise contribution of the amplifier (see col. 5, lines 43–46).

Therefore, for an application for low-noise amplification, it would have been obvious for a person skilled in the art to implement Nakahara et al receive amplifier (comprising (7a, 7b)) with low-noise amplifiers, as taught by Lazzarotto et al , so that the amplification of the receiver amplifier would be optimized for low noise.

Allowable Subject Matter

7. Claims 8–16 are allowed.

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–Regarding to claim 8, none of prior art of record teaches a phased array system comprising a plurality of radiating elements, a bi-directional amplifier which has a first port and a second port, a receiver amplifier electrically connected between the second port and the first port, and transmitter amplifier electrically connected between the first port and second port, wherein the second port is electrically connected to each radiating element.

8. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

–Regarding to claim 6, the cited references fail to teach a receiver input matching network and output matching network for optimizing a receiver amplifier noise figure, and a transmitter input matching network and output matching network for a transmit amplifier wherein said receiver input and output matching networks are asymmetrical to said transmitter input and output matching networks.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sanh D. Phu whose telephone number is (571)272-7857. The examiner can normally be reached on M-Th from 7:00-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on (571) 272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sanh D. Phu
Examiner
Division 2618

SP

4/4/06



**SANH D. PHU
PATENT EXAMINER**